



SEQUENCE LISTING

<110> VAN DEN BOOM, DIRK
BOCKER, SEBASTIAN

<120> FRAGMENTATION-BASED METHODS AND SYSTEMS FOR SEQUENCE
VARIATION DETECTION AND DISCOVERY

<130> SEQ-2073-UT

<140> 10/723,365

<141> 2003-11-26

<150> 60/429,895

<151> 2002-11-27

<160> 85

<170> PatentIn Ver. 3.2

<210> 1

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 1

Pro Phe His Leu Leu Val Tyr
1 5

<210> 2

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<220>

<221> MOD_RES

<222> (5)

<223> Any amino acid except pro or arg

<400> 2

Ile Glu Gly Arg Xaa
1 5

<210> 3

<211> 5

<212> PRT

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<220>
 <221> MOD_RES
 <222> (5)
 <223> Any amino acid except pro or arg

<400> 3
 Ile Asp Gly Arg Xaa
 1 5

<210> 4
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<220>
 <221> MOD_RES
 <222> (5)
 <223> Any amino acid except pro or arg

<400> 4
 Ala Glu Gly Arg Xaa
 1 5

<210> 5
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<220>
 <221> MOD_RES
 <222> (2)
 <223> Variable amino acid

<220>
 <221> MOD_RES
 <222> (5)
 <223> Variable amino acid

<400> 5
 Pro Xaa Gly Pro Xaa
 1 5

<210> 6
 <211> 49
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 6
 cagtaatacag actcactata gggagaaggc tccccagcaa gacggactt

49

<210> 7
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 7
 aggaagagag cgcctcggca aagtacac

28

<210> 8
 <211> 340
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 8
 gggagaaggc tccccagcaa gacggacttc ttcaaaaaca tcatgaactt catagacatt 60
 gtggccatca ttccttattt catcacgctg ggcaccgaga tagctgagca ggaaggaaac 120
 cagaagggcg agcaggccac ctccctggcc atcctcaggg tcatccgctt ggtaagggtt 180
 tttagaatct tcaagctctc ccgccactct aagggcctcc agatccctggg ccagaccctc 240
 aaagctagta tgagagagct agggctgctc atctttttcc tcttcacggt ggtcatcctg 300
 ttttctagtg cagtgtactt tgccgaggcg ctctcttcct 340

<210> 9
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 9
 cccagtcacg acgttgtaaa acg

23

<210> 10
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 primer

<400> 10
 agcggataac aatttcacac agg

23

<210> 11
 <211> 117
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 11
 cccagtcacg acgttgtaaa acgtccaggg aggactcacc atgggcattt gattgcagag 60
 cagctccgag tccatccaga gcttcctgca gtcacctgtg tgaaattgtt atccgct 117

<210> 12
 <211> 21
 <212> DNA
 <213> Artificial Sequence

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<223> Description of Artificial Sequence: Illustrative
 nucleotide sequence

<220>

<221> modified_base

<222> (1)..(3)

<223> a, c, g, t, unknown, or other

<220>

<221> modified_base

<222> (8)..(10)

<223> a, c, g, t, unknown, or other

<220>

<221> modified_base

<222> (12)..(14)

<223> a, c, g, t, unknown, or other

<220>

<221> modified_base

<222> (19)..(21)

<223> a, c, g, t, unknown, or other

<400> 12
 nnnactgnnn mnnntgacnn n

21

<210> 13
 <211> 583
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic amplicon
 sequence

<400> 13
 cttcagtgtcacacccgaccctatgagtggggcggtcaaa ctgtcccat tttacacaca 60
 gggaaactta gtgaatggca aggctgggttgagccagc tctattgccc ccaaagataa 120
 ggctccattc cctgctccat tttccaggca tagggacttg tagggggctg gaaccccagg 180
 atcaactctg ggctcagagg gccccagcaa taagtgactg ttgattactc ctgatcccaa 240
 agctgacttc aggcaagctc cttggagggtc gcagcccctt cttgctatgc ccagtggcaa 300
 tgatgttcat aatcccactc ctcaagtgcag gggtccacta agaaccatg atctcctacc 360
 tcaaattggac ctcatgcttt ctgagtaagc ctccctcagc tttctggtca cctcactccc 420
 cccacccact gcaatgactt cttcaggcct tccctgccat cctcaaactc ccagctgccc 480
 cctcctgtct accttccact tccctctcca cacacaacct gcttaccaga gagctgagca 540
 gagccaccaa cagaacttcc cccccacgtc gctgctccca gtc 583

<210> 14
 <211> 483
 <212> DNA
 <213> Mycobacterium abscessus

<400> 14
 acgggtgagt aacacgtggg tgatctgccc tgcactctgg gataagcctg ggaaactggg 60
 tctaataccg gataggacca cacacttcat ggtgagtggg gcaaagcttt tgcggtgtgg 120
 gatgagcccc cggcctatca gcttggttgg ggggtaatgg cccaccaagg cgacgacggg 180
 tagccggcct gagaggggtga ccggccacac tgggactgag atacggccca gactcctacg 240
 ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
 agggatgacg gccttcgggt tgtaaacctc tttcagtagg gacgaagcga aagtgacggg 360
 acctacagaa gaaggaccgg ccaactacgt gccagcagcc gcggtaatac gtagggtccg 420
 agcgttgtcc ggaattactg ggcgtaaaga gctcgtaggt ggtttgtcgc gttgttcgtg 480
 aaa

<210> 15
 <211> 495
 <212> DNA
 <213> Mycobacterium avium

<400> 15
 acgggtgagt aacacgtggg caatctgccc tgcacttcgg gataagcctg ggaaactggg 60
 tctaataccg gataggacct caagacgcat gtcttctggg ggaaagcttt tgcggtgtgg 120
 gatgggcccc cggcctatca gcttggttgg ggggtgacgg cctaccaagg cgacgacggg 180
 tagccggcct gagaggggtg ccggccacac tgggactgag atacggccca gactcctacg 240
 ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
 ggggatgacg gccttcgggt tgtaaacctc tttcaccatc gacgaagggt cgggttttct 360
 cggattgacg gtagggtggag aagaagcacc ggccaactac gtgccagcag ccgcggtaat 420
 acgtagggtg cgagcgttgt ccggaattac tgggcgtaaa gagctcgtag gtggtttgtc 480
 gcgttgttcg tgaaa 495

<210> 16
 <211> 495
 <212> DNA
 <213> *Mycobacterium celatum*

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<400> 16
acgggtgagt aacacgtggg tgatctgccc tgcacttcgg gataagcttg ggaaactggg 60
tctaataaccg gataggacca tgggatgcat gtcttggtgt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gcttggttgg ggggtgatgg cctaccaagg cgacgacggg 180
tagccggcct gagaggggtg ccggccacac tgggactgag atacggccca gactcctacg 240
ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
ggggatgacg gccttcgggt tgtaaacctc tttcaccatc gacgaagctg ccgggttttc 360
ggtggtgacg gtaggtggag aagaagcacc ggccaactac gtgccagcag ccgcggtaat 420
acgtagggtg cgagcgttgt ccggaattac tgggcgtaaa gagctcgtag gtggtttgtc 480
gcgttggtcg tgaaa                                     495
```

<210> 17
 <211> 483
 <212> DNA
 <213> *Mycobacterium fortuitum*

```
<400> 17
acgggtgagt aacacgtggg tgatctgccc tgcactttgg gataagcctg ggaaactggg 60
tctaataaccg aatatgacca cgcgcttcat ggtgtgtggt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gcttggttgg ggggtaatgg cctaccaagg cgacgacggg 180
tagccggcct gagaggggtg ccggccacac tgggactgag atacggccca gactcctacg 240
ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
agggatgacg gccttcgggt tgtaaacctc tttcaatagg gacgaagcgc aagtgcgggt 360
acctatagaa gaaggaccgg ccaactacgt gccagcagcc gcggtaatag gtagggtccg 420
agcgttgtcc ggaattactg ggcgtaaaaga gctcgtagggt ggtttgcgcg gttgttcgtg 480
aaa                                     483
```

<210> 18
 <211> 495
 <212> DNA
 <213> *Mycobacterium gordonae*

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<400> 18
acgggtgagt aacacgtggg taatctgccc tgcacatcgg gataagcctg ggaaactggg 60
tctaataaccg aataggacca caggacacat gtcctgtggt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gcttggttgg ggggtgatgg cctaccaagg cgacgacggg 180
tagccggcct gagaggggtg ccggccacac tgggactgag atacggccca gactcctacg 240
ggaggcagca gtggggaata ttgcacaatg ggcgaaaagcc tgatgcagcg acgccgcgtg 300
ggggatgacg gccttcgggt tgtaaacctc tttcaccatc gacgaaggtc ccgggttttct 360
cgggctgacg gtaggtggag aagaagcacc ggccaactac gtgccagcag ccgcggtaat 420
acgtagggtg cgagcgttgt ccggaattac tgggcgtaaa gagctcgtag gtggtttgtc 480
gcgttggtcg tgaaa                                     495
```

<210> 19
 <211> 495
 <212> DNA
 <213> *Mycobacterium intracellulare*

```
<400> 19
acgggtgagt aacacgtggg caatctgccc tgcacttcgg gataagcctg ggaaactggg 60
```

| | | | | | | |
|-------------|------------|------------|-------------|------------|------------|-----|
| tctaataaccg | gataggacct | ttaggcgcac | gtcttttaggt | ggaaagcttt | tgcggtgtgg | 120 |
| gatgggccc | cggcctatca | gcttggttgg | ggggtgatgg | cctaccaagg | cgacgacggg | 180 |
| tagccggcct | gagaggggtg | ccggccacac | tgggactgag | atacggccca | gactcctacg | 240 |
| ggaggcagca | gtggggaata | ttgcacaatg | ggcgcaagcc | tgatgcagcg | acgccgcgtg | 300 |
| ggggatgacg | gccttcgggt | tgtaaacctc | tttcaccatc | gacgaaggct | cgggttttct | 360 |
| cggattgacg | gtaggtggag | aagaagcacc | ggccaactac | gtgccagcag | ccgcggtaat | 420 |
| acgtaggggtg | cgagcgttgt | ccggaattac | tgggcgtaaa | gagctcgtag | gtggtttgtc | 480 |
| gcgttggttcg | tgaaa | | | | | 495 |

<210> 20

<211> 495

<212> DNA

<213> Mycobacterium kansasii

<400> 20

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| acgggtgagt | aacacgtggg | caatctgccc | tgcacaccgg | gataagcctg | ggaaactggg | 60 |
| tctaataaccg | gataggacca | cttggcgcac | gccttgttgg | ggaaagcttt | tgcggtgtgg | 120 |
| gatgggccc | cggcctatca | gcttggttgg | ggggtgacgg | cctaccaagg | cgacgacggg | 180 |
| tagccggcct | gagaggggtg | ccggccacac | tgggactgag | atacggccca | gactcctacg | 240 |
| ggaggcagca | gtggggaata | ttgcacaatg | ggcgcaagcc | tgatgcagcg | acgccgcgtg | 300 |
| ggggatgacg | gccttcgggt | tgtaaacctc | tttcaccatc | gacgaaggct | cgggttttct | 360 |
| cggattgacg | gtaggtggag | aagaagcacc | ggccaactac | gtgccagcag | ccgcggtaat | 420 |
| acgtaggggtg | cgagcgttgt | ccggaattac | tgggcgtaaa | gagctcgtag | gtggtttgtc | 480 |
| gcgttggttcg | tgaaa | | | | | 495 |

<210> 21

<211> 495

<212> DNA

<213> Mycobacterium marinum

<400> 21

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| acgggtgagt | aacacgtggg | cgatctgccc | tgcacttcgg | gataagcctg | ggaaactggg | 60 |
| tctaataaccg | gataggacca | cgggattcat | gtcctgttgg | ggaaagcttt | tgcggtgtgg | 120 |
| gatgggccc | cggcctatca | gcttggttgg | ggggtaacgg | cctaccaagg | cgacgacggg | 180 |
| tagccggcct | gagaggggtg | ccggccacac | tgggactgag | atacggccca | gactcctacg | 240 |
| ggaggcagca | gtggggaata | ttgcacaatg | ggcgcaagcc | tgatgcagcg | acgccgcgtg | 300 |
| ggggatgacg | gccttcgggt | tgtaaacctc | tttcaccatc | gacgaaggct | cgggttttct | 360 |
| cggattgacg | gtaggtggag | aagaagcacc | ggccaactac | gtgccagcag | ccgcggtaat | 420 |
| acgtaggggtg | cgagcgttgt | ccggaattac | tgggcgtaaa | gagctcgtag | gtggtttgtc | 480 |
| gcgttggttcg | tgaaa | | | | | 495 |

<210> 22

<211> 492

<212> DNA

<213> Mycobacterium scrofulaceum

<400> 22

| | | | | | | |
|-------------|-------------|------------|-------------|------------|-------------|-----|
| acgggtgagt | aacacgtggg | caatctgccc | tgcacttcgg | gataagcctg | ggaaactggg | 60 |
| tctaataaccg | gataggacca | cttggcgcac | gccttgttgg | ggaaagcttt | tgcggtgtgg | 120 |
| gatgggccc | cggcctatca | gctagtttgg | ggggtgatgg | cctaccaagg | cgacgacggg | 180 |
| tagccggcct | gagaggggtg | ccggccacac | tgggactgag | atacggccca | gactcctacg | 240 |
| ggaggcagca | gtggggaata | ttgcacaatg | ggcgcaagcc | tgatgcagcg | acgccgcgtg | 300 |
| ggggatgacg | gccttcgggt | tgtaaacctc | tttcaccatc | gacgaaggct | cactttgtgg | 360 |
| ggtgacggta | ggtggagaag | aagcaccggc | caactacgtg | ccagcagccg | cggtaataacg | 420 |
| taggggtgcga | gcgttggtccg | gaattactgg | gcgttaaagag | ctcgtaggtg | gtttgtcgcg | 480 |

ttgttcgtga aa

492

<210> 23

<211> 485

<212> DNA

<213> *Mycobacterium smegmatis*

<400> 23

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acgggtgagt aacacgtggg tgatctgccc tgcacttttg gataagcctg ggaaactggg 60
tctaataaccg aatacaccct gctggtcgca tggcctggta ggggaaagct tttgcggtgt 120
gggatggggcc cgcggcctat cagcttggtg gtggggtgat ggcctacca ggcgacgacg 180
ggtagccggc ctgagagggg gaccggccac actgggactg agatacggcc cagactccta 240
cgggaggcag cagtggggaa tattgcacaa tgggcgcaag cctgatgcag cgacgccgcg 300
tgagggatga cggccttcgg gttgtaaacc tctttcagca cagacgaagc gcaagtgcag 360
gtatgtgcag aagaaggacc ggccaactac gtgccagcag ccgcggtaat acgtagggtc 420
cgagcgttgt ccggaattac tgggcgtaaa gagctcgtag gtggtttgtc gcgttggttcg 480
tgaaa 485
```

<210> 24

<211> 497

<212> DNA

<213> *Mycobacterium tuberculosis*

<400> 24

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acgggtgagt aacacgtggg tgatctgccc tgcacttcgg gataagcctg ggaaactggg 60
tctaataaccg gataggacca cgggatgcat gtcttgtggg ggaaagcgct ttagcgggtgt 120
gggatgagcc cgcggcctat cagcttggtg gtggggtgac ggcctacca ggcgacgacg 180
ggtagccggc ctgagagggg gtccggccac actgggactg agatacggcc cagactccta 240
cgggaggcag cagtggggaa tattgcacaa tgggcgcaag cctgatgcag cgacgccgcg 300
tgggggatga cggccttcgg gttgtaaacc tctttcacca tcgacgaagg tccgggttct 360
ctcggattga cggtaggtgg agaagaagca cgggccaaact acgtgccagc agccgcggta 420
atacgtaggg tgcgagcgtt gtccggaatt actgggcgta aagagctcgt aggtgggtttg 480
tcgcgttgtt cgtgaaa 497
```

<210> 25

<211> 499

<212> DNA

<213> *Mycobacterium xenopi*

<400> 25

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acgggtgagt aacacgtggg tgacctgccc tgcacttcgg gataagcctg ggaaactggg 60
tctaataaccg gataggacca ttctgcgcat gtggggtggg ggaaagtgtt tggtagcggg 120
gtgggatggg cccgcggcct atcagcttgt tgggtgggtg atggcctacc aaggcgacga 180
cgggtagccg gcctgagagg gtgtccggcc aactggggac tgagatacgg ccagactcc 240
tacgggaggg agcagtgggg aatattgcac aatgggcgca agcctgatgc agcgacgccg 300
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ttctcgtggg gacggtaggg gcagaagaag caccggccaa ctacgtgcca gcagcccgcg 420
taatacgtag ggtgcaagcg ttgtccggaa ttactgggcg taaagagctc gtaggcggct 480
tgtcgcgttg ttctgggaa 499
```

<210> 26

<211> 492

<212> DNA

<213> *Mycobacterium paraffinicum*

<400> 26
acgggtgagt aacacgtggg caatctgccc tgcacttcgg gataagcctg ggaaactggg 60
tctaataaccg gataggacca cttggcgcat gccttgtggt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gcttgttggt ggggtgatgg cctaccaagg cgacgacggg 180
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ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
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gttgacggta ggtggagaag aagcaccggc caactacgtg ccagcagccg cggtaatacg 420
taggggtgcga gcgttgtccg gaattactgg gcgtaaagag ctcgtaggtg gtttgtcgcg 480
ttgttcgtga aa 492

<210> 27
<211> 483
<212> DNA
<213> *Mycobacterium interjectum*

<400> 27
acgggtgagt aacacgtggg taatctgccc tgcacttcgg gataagcctg ggaaactggg 60
tctaataaccg gataggacct cgaggcgcat gccttgtggt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gctagtgtgt ggggtgacgg cctaccaagg cgacgacggg 180
tagccggcct gagaggggtgt ccggccacac tgggactgag atacggccca gactcctacg 240
ggaggcagca gtggggaata ttgcacaatg ggcgcaagcc tgatgcagcg acgccgcgtg 300
ggggatgacg gccttcgggt tgtaaacctc tttcagcagg gacgaagcgc aagtgcgggt 360
acctgcagaa gaagcaccgg ccaactacgt gccagcagcc gcggtaatac gttaggggtgcg 420
agcgttgtcc ggaattactg ggcgtaaaga gctcgtaggt ggtttgtcgc gttgttcgtg 480
aaa 483

<210> 28
<211> 484
<212> DNA
<213> *Mycobacterium aurum*

<400> 28
acgggtgagt aacacgtggg tgatctgccc tgcactttgg gataagcctg ggaaactggg 60
tctaataaccg aataggacta cgcgatgcat gtcgtgtggt ggaaagcttt tgcggtgtgg 120
gatgggcccg cggcctatca gcttgttggt gaggttacgg ctaccaagg cgacgacggg 180
tagccggcct gagaggggtga ccggccacac tgggactgag atacggccca gactcctacg 240
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agggatgacg gccttcgggt tgtaaacctc tttcgccagg gacgaagcgc aagtgcgggt 360
acctggagaa gaaggaccgg ccaactacgt gccagcagcc gcggtaataa cgtaggggtgc 420
gagcgttgtc cggaattact gggcgtaaag agctcgtagg tggtttgtcg cgttgttcgt 480
gaaa 484

<210> 29
<211> 1542
<212> DNA
<213> *Escherichia coli*

<400> 29
aaattgaaga gtttgatcat ggctcagatt gaacgctggc ggcaggccta acacatgcaa 60
gtcgaacggg aacaggaaga agcttgcttc tttgctgacg agtggcggac gggtagtaaa 120
tgtctgggaa actgcctgat ggagggggat aactactgga aacggtagct aataccgcat 180
aacgtcgcaa gaccaaagag ggggaccttc gggcctcttg ccatcggatg tgcccagatg 240
ggattagcta gtaggtgggg taacggctca cctaggcgac gatccctagc tgggtctgaga 300

```

ggatgaccag ccacactgga actgagacac ggtccagact cctacgggag gcagcagtgg 360
ggaatattgc acaatgggcg caagcctgat gcagccatgc cgcgtgtatg aagaaggcct 420
tcgggttgta aagtactttc agcggggagg aaggagtaa agttaatacc tttgctcatt 480
gacgttaccg gcagaagaag caccggctaa ctccgtgcca gcagccgcgg taatacggag 540
ggtgcaagcg ttaatcggaa ttactgggcg taaagcgcac gcaggcgggt tgttaagtca 600
gatgtgaaat ccccgggctc aacctgggaa ctgcatctga tactggcaag cttgagtctc 660
gtagaggggg gtagaattcc aggtgtagcg gtgaaatgcg tagagatctg gaggaatacc 720
ggtaggggaa gcggccccct ggacgaagac tgacgctcag gtgcgaaagc gtggggagca 780
aacaggatta gataccctgg tagtccacgc cgtaaacgat gtcgacttgg aggttgtgcc 840
cttgaggcgt ggcttccgga gctaacgcgt taagtgcacc gcctggggag tacggccgca 900
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tcgatgcaac gcgaagaacc ttacctggct ttgacatcca cggaaagttt cagagatgag 1020
aatgtgcctt cgggaaccgt gagacagggt gtcatggct gtcgtcagct cgtgttgtga 1080
aatgttgggt taagtccgc aacgagcgca acccttatcc tttgttgcca gcggtccggc 1140
cgggaactca aaggagactg ccagtataaa actggaggaa ggtggggatg acgtcaagtc 1200
atcatggccc ttacgaccag ggctacacac gtgctacaat ggcgataca aagagaagcg 1260
acctcgcgag agcaagcgga cctcataaag tgcgtcgtag tccggattgg agtctgcaac 1320
tcgactccat gaagtcggaa tcgctagtaa tcgtggatca gaatgccacg gtgaatacgt 1380
tcccgggcct tgtacacacc gcccgtcaca ccatgggagt gggttgcaaa agaagtaggt 1440
agcttaacct tcgggagggc gcttaccact ttgtgattca tgactggggg gaagtcgtaa 1500
caaggttaacc gtaggggaac ctgcggttgg atcacctcct ta 1542

```

<210> 30

<211> 340

<212> DNA

<213> *Bordetella avium*

<400> 30

```

agagtttgat cctggctcag attgaacgct ggcgggatgc tttacacatg caagtcgaac 60
ggcagcacgg acttcggtct ggtggcgagt ggcgaaacgg tgagtaatgt atcggaacgt 120
gcctagtagc gggggataac tacgcgaaag cgtagctaata accgcatacg ccctacgggg 180
gaaagcgggg gaccttcggg cctcgcaacta ttagagcggc cgatatcgga ttagctagtt 240
ggtggggtaa cggctcacca aggcgacgat ccgtagctgg tttgagagga cgaccagcca 300
cactgggact gagacacggc ccagactcct acgggaggca 340

```

<210> 31

<211> 339

<212> DNA

<213> *Bordetella trematum*

<400> 31

```

agagtttgat cctggctcag attgaacgct ggcgggatgc tttacacatg caagtcggac 60
ggcagcacgg acttcggtct ggtggcgagt ggcgaaacgg tgagtaatgt atcggaacgt 120
gcccagtagc gggggataac tacgcgaaag cgtggctaata accgcatacg ccctacgggg 180
aaagcggggg accttcgggc ctgcgactat tggagcggcc gatatacgga tagctagttg 240
gtggggtaac ggctcaccaa ggcgacgatc cgtagctggg ttgagaggac gaccagccac 300
actgggactg agacacggcc cagactccta cgggaggca 339

```

<210> 32

<211> 1496

<212> DNA

<213> *Bordetella petrii*

<220>
 <221> modified_base
 <222> (821)
 <223> a, c, g, or t

<400> 32
 cgctagcggg atgctttaca catgcaagtc gaacggcagc gcggaacttcg gtctggcggc 60
 gaggggcgaa cgggtgagta atgtatcgga acgtgccag tagcggggga taactacgcg 120
 aaagcttagc taataaccga tacgccctac gggggaaagc gggggacctt cgggcctcgc 180
 actattggag cggccgatat cggattagct agttggtggg gtaaaggcct accaaggcga 240
 cgatccgtag ctggtttgag aggacgacca gccacactgg gactgagaca cggcccagac 300
 tcctacggga ggcagcagtg gggaattttg gacaatgggg gcaaccctga tccagccatc 360
 ccgcgtgtgc gatgaaagcc ttcgggttgc aaagcacttt tggcaggaaa gaaacggctc 420
 tggctaatac ctgggggcaac tgacgggtacc tgcagaataa gcaccggcta actacgtgcc 480
 agcagccgcg gtaatacgta gggtgcaagc gttaatcgga attactgggc gtaaagcgtg 540
 cgcaggcggt tcggaagaa agatgtgaaa tcccagggt taaccttggg actgcatttt 600
 taactaccgg gctagagtgt gtcagaggga ggtggaattc cgcgtgtagc agtgaaatgc 660
 gtagatatgc ggaggaacac cgatggcgaa ggcagcctcc tgggataaca ctgacgctca 720
 tgcacgaaag cgtggggagc aaacaggatt agataccctg gtagtccacg ccctaaacga 780
 tgtcatctag ctgttgggga cttcgggtcct tggtagcgca nctaaccgct gaagttgacc 840
 gcctggggag tacggctcga agattaaaac tcaaagggaat tgacggggac ccgcacaagc 900
 ggtggatgat gtggattaat tcgatgcaac gcgaaaaacc ttacctacc ttgacatgtc 960
 tggaatgccg aagagatttg gcagtgtcgc caagagaacc ggaacacagg tgctgcatgg 1020
 ctgtcgtcag ctcgtgtcgt gagatgttgg gtttaagtccc gcaacgagcg caacccttgc 1080
 cattagttgc tacgaaagg cactctaatt agactgccgg tgacaaaccg gaggaagggtg 1140
 gggatgacgt caagtccctca tggcccttat gggtagggct tcacacgtca tacaatggtc 1200
 gggacagagg gctgcccaacc cgcaaggggg agccaatccc agaaacccga tcgtagtccg 1260
 gatcgcagtc tgcaactcga ctgcgtgaag tcggaatcgc tagtaatcgc ggatcagcat 1320
 gtcgcgggtga atacgttccc ggggtcttgta cacaccgcc gtcacaccat gggagtgggt 1380
 tttaccagaa gtagttagcc taaccgcaag gggggcgatt accacggtag gattcatgac 1440
 tgggggtgaag tcgtaacaag gtagccgtat cgggaagggtc ggttggatca cctcct 1496

<210> 33
 <211> 363
 <212> DNA
 <213> Bordetella sp.

<400> 33
 agagtttgat cctgggtcag gacgaacgct ggcggcgtgc ctaacacatg caagtccgaac 60
 gcgagtgtct tttttcgcaa gagagcagac acttgagtgg cgaacgggtg agtaacacgt 120
 gagcgactca cttccgggtg ggggataact gtccgaaagg gcggctaata cctcgtatgc 180
 tccttgaccg ccgggtcagt gaggaagtg ggcttcgtaa gaagctcatg ccagaagaga 240
 ggctcgcgcc ccatcagcta gttggcgagg taacggctca ccaaggcaat gacgggtagc 300
 tgggtctgaga ggatgggtcag ccactctggg actgagacac ggcccagact cctacgggag 360
 gca 363

<210> 34
 <211> 363
 <212> DNA
 <213> Bordetella sp.

<400> 34
 agagtttgat cctgggtcag gacgaacgct ggcggcgtgc ctaacacatg caagtccgaac 60
 gcgagtgtct tttttcgtaa gaaagggtgac acttgagtgg cgaacgggtg agtaacacgt 120
 gagtaactca cttccgggtg ggggataact gtccgaaagg gtggctaata ccccatatgc 180
 tccttgaccg ccgggtcagt gagaaaagtg ggcttcgtaa gaagctcaca ccagaagaga 240

```

ggctcgcgcc ccatcagctg gttggcgagg taatgggtca ccaaggcaat gacgggtagc 300
tggtctgaga ggatgggtcag ccacactggg actgagacac ggcccagact cctacgggag 360
gca 363

```

<210> 35
 <211> 343
 <212> DNA
 <213> Bordetella sp.

```

<400> 35
agagtttgat catggctcag gatgaacgct ggcggcgtgc ttaatacatg caagtcgaac 60
ggagggaggt agtaatactt tccttagtgg cgaacgggtg agaaacgcgt tggtagacctg 120
ccccgaagag cgggacaaca gaccgaaagg tttgctaata ccgcatgagc tcttgctggc 180
tagagtggca agaggaaagg ccgaaaggcg ctttgggagg ggctgcgtc ccatcagcta 240
gttggcgggg taacagccca ccaaggcgat gacgggtagg ggacctgaga gggtagacccc 300
ccacaatgga actgaaacac ggtccataca cctacgggtg gca 343

```

<210> 36
 <211> 342
 <212> DNA
 <213> Bordetella sp.

```

<400> 36
agagtttgat catggctcag gatgaacgct ggcggcgtgc ctaatacatg caagtcgaac 60
gggagatgta gcgatatgtc tcagtgggcg aacgggtgag taacgcgttg gtgacctgcc 120
ccgaagagcg ggataacaga ccgaaaggac tgctaatacc gcatgagctc tcggcagtta 180
gaggggcccga gaggaaaggc cgaaaggcg ctttgggagg gcctgcgtcc catcagctag 240
ttggcgaggt aagagctcac caaggcgatg acgggtaggg gacctgagag ggtgaccccc 300
cacaatggaa ctgaaacacg gtccatacac ctacgggtgg ca 342

```

<210> 37
 <211> 342
 <212> DNA
 <213> Bordetella sp.

```

<400> 37
agagtttgat catggctcag attgaacgct ggcggcatgc tttacacatg caagtcgaac 60
ggcagcacgg gcttcggcct ggtggcgagt ggcgaacggg tgagtaatgc atcggaacgt 120
gcccatttgt gggggataac gcggcgaaag tcgcgctaata accgcatacg ccctgagggg 180
gaaagcgggg gattcttcgg agcctcgcgc aattggagcg gccgatgtca gattagctag 240
ttggtagggt aaaggcctac caaggcgacg atctgtagcg ggtctgagag gatgatccgc 300
cacactggga ctgagacacg gccagactc ctacgggagg ca 342

```

<210> 38
 <211> 342
 <212> DNA
 <213> Bordetella sp.

```

<400> 38
agagtttgat catggctcag attgaacgct ggcggcatgc tttgcacatg caagtcgaac 60
ggcagcacgg gcttcggcct ggtggcgagt ggcgaacggg tgagtaatgc atcggaacgt 120
gcccatttgt gggggataac gcggcgaaag tcgcgctaata accgcatacg ccctgagggg 180
gaaagcgggg gattcttcgg aacctcgcgc aattggagcg gccgatgtca gattagctag 240
ttggtagggt aaaggcctac caaggcgacg atctgtagcg ggtctgagag gatgatccgc 300

```

cacactggga ctgagacacg gccagactc ctacgggagg ca 342

<210> 39
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 39
 agagtttgat cmtggctcag 20

<210> 40
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 40
 aaggaggtga tccakccrca 20

<210> 41
 <211> 38
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 41
 gtaatacgac tcactatagg gacgggtgag taacacgt 38

<210> 42
 <211> 40
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 42
 atttaggtga cactatagaa tttcacgaac aacgcgacaa 40

<210> 43
 <211> 418
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 43
 accatgctg ctgctccctg cctgccagcg ccctgcacat actttgcaca tggctggggg 60
 ccagctgctg gtccctgggg actcggatgg cacagagggc cccttcctgc caccatcacg 120
 gctcagacct caggttcctg gagagtaggg gtgggggtgct gaggggcaga gggaagtgcc 180
 gcaaaccccc tgggtgggcgc ggtgccagcc cccagggccg attcccatcc agttgaccga 240
 gcttgtgctg gtcaccgctg tttccgcagg acagagtccc cacagccgct gggcaccctg 300
 gtcccattcg cggccacttt cctgtctgaa gaccgcatgt tgccgggctg tgcttacggc 360
 tcgcggggcg actctactga caagcgggtg gcggccctcac agactctccc agggccgc 418

<210> 44
 <211> 269
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 44
 cgtccacaaa atgattctga attagctgta tcgtcaaggc actcttgct acgccaccag 60
 ctccaactac cacaagttta tattcagtca ttttcagcag gccttataat aaaaataatg 120
 aaaatgtgac tatattagaa catgtcacac ataagggtta tacactatca aatactccac 180
 cagtaccttt taatacaaac tcacctttat atgaaaaatt atttcaaaat accttacaaa 240
 attcaatcat gaaaattcca gttgactgc 269

<210> 45
 <211> 428
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 45
 gggaacatct tgctgctctc agagccagaa aatgctgaca gcctcatgct ggtggacttc 60
 gagtacagca gttataacta taggtgaggc tggaaagatg gcttccata gatctgttcc 120
 cayagggctc ttgaaaacag gccagctgcc cagggcattt ggggactgaa tgtccacctt 180
 attctcccag gggctttgac attgggaacc atttttgtga gtgggtttat gattatactc 240
 acgaggaatg gcctttctac aaagcaaggc ccacagacta cccactcaa gaacagcagg 300
 tatgtgggac agaggctggg gagcaggacc catcctgtga ggaaggaggg aggtggagtc 360
 tggaaggaat ggccggaaag gatgttacct gggaaatact ccacagtctc cccaattcct 420
 gactcttg 428

<210> 46
 <211> 429
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```
<400> 46
cccactactc tgccttcctg ttcagtaact cttacttttg cctgaagtaa cagcatcttc 60
tacttctcca tctagagatt tttgtgtgtg tgccatcaag gttagcaaac tttatacgta 120
gcctaacact taaaaaatgc actcattatc ttaaacctaa taaattccag agtkttattk 180
ggttctcctc tggtgccctt cctaaaaaat gagctgaaga tgacagtatt tttctttaca 240
tgcttggtta tgacttttaa agttttattt aaataaatgt tgaagctcaa gtttaaagaa 300
gcgttgacaga ggcccayggt ctctggggtc cgggccacct gtccatattc cacatttgct 360
gactgtgctc cctgcactcc actcaagttg agagttcaaa tagtcttgaa ggggaatcag 420
cttcaggat
```

<210> 47
 <211> 465
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```
<400> 47
ggaagtgggt ttggagggtg taactcacta tttttaggct agaacacaaa gaacaattag 60
tgaatttaag taagaaaagt gaagttatca actaatgtgc tattaataat attattttta 120
gtaagaggca tcctaggagt tacagaaagt ctacattcta cagaaatgtc ttcctctcaa 180
gtcttcagag agcaaagggt acagctacct aaagtgtttc cacttcaagc acagattgta 240
tgcctgaaga ctacatacct tgcatatca accagttcag caagrrcacc aaacaagaat 300
tcgtgagtggt ttctgaaatg ataaatacta aaagtcagca aaagaattat tgaagttata 360
attcctaata aaaagccatg gttataaaat atttaagttt tttgaaaaaa atcttaaaac 420
caccatttgc attgttttta tactactcaa ggctttccag agctc 465
```

<210> 48
 <211> 426
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```
<400> 48
tatgataggg aagatgcggc catcactggg atattttcaa atcccaagga catcagagtg 60
aagtgtcagt tgtcagatga ttttaaaagt tatgtcttca gagaaaaaaa gattcatttt 120
ctcattttta rccaattaaa tattctgagt gagactaatc actcatttgc ctacgacctt 180
ttagaaaagt tgttttgttg aaatactgta cgtacgctta atctaaattt gcattgacta 240
tgtttttagt tattttataaa tgggtgaactc agtttctgaa attaaacttc ttatttgcaa 300
ttttctagtg ctggcagaca ctggcctttt attttttagga taagaaaaca ggcattattct 360
ttgtggtcca ttatctagag cccatacttg ggcagcattt gaaatttcac ctttaaccca 420
gacagg
```

<210> 49
 <211> 533
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 49
 tgcacagggt ttgatctctg agatgtttta tactctctgg cttggaraar rracagtcct 60
 gtagtatcaa gaccagacct tgtgtcccca gcccaaggct gccctgggccc yagggacagt 120
 atttgagac ttygytggca gttttgcgtt ggaatcacct ggtgcctccc tgtacgtcca 180
 ccaycctgt gccagakcc ccttcgcaag caccatatgc tgttagatcc tgcagcagcc 240
 ttgtgggaca gmacccctgg ggctgggtatc accatttatg taagaaaaaa aaggaagtgc 300
 tggcccaggg tcccacagcc agcaagtgtg agctgcactg cccaagcagg tccttttagyc 360
 agctctctgt tttcccca gcccctcagc ccccaggca gctctaaggc ctcagctgct 420
 gcaggattcc ttagagaagc tgaagggttt gggtcctcag ctctgggccc gggcaagtct 480
 ggccaagcag catggcagcg atgaagtcca catgatcgaa gggtggatgc tta 533

<210> 50
 <211> 422
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 50
 caaggcttga ctgaaggacc tcatccagag tcactatcag agctcgctcc agcactctcc 60
 ttcattggagc cccaggggtca gcagtggaga gggctcagagc acccccacaa ccccacagc 120
 gagatgacct sggctcgtct tgccctctgcc accagagctg tgactgtggg caagatatct 180
 tacagcagga ccagtttctt gtccgaaggc agggctatta acaggacctt actcaggata 240
 cttgtgtgga taaaatcatg tgtgaagagc ttttagggcc ttgcttctca aagaggggcc 300
 ccaggccatc agcacacctg gagtgtgcag ggggaagctc tcagccccac cccagccctc 360
 tttacaagac ccccgctgg caccctgtggc gtggcacctg tgtgcactcg tgttttcaaa 420
 gc 422

<210> 51
 <211> 411
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 51
 atccctctgt ctctccacca ggaactagaa ttttgtgtat cactgcgctt atttttttct 60
 tttagtttac cacatgtgta tgtatctata agtaataata cgatctgttt tgcttctcta 120
 tattgtgcca tatgtcgttt ttagcaactt gcttttagct gacgttctgt tttcaagatt 180
 catccatgtt gctgcataaa cctaacattc acttactgtt gctgggtgaw aacawwccaw 240
 cawgwagca cagacatttg ggttgtttcc aagacatgta tcaatggcaa aaattaagat 300


```

gtctgacaaa accaagagtt ggagaggatg tggatggctt ggaattttat ctgctccttt 360
acaccactc  tggaaaaact gtacaaacaa ttctgcaagg atttttccag a          411

```

```

<210> 52
<211> 445
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 52
tagtgaaaag ggcacacagc tgtaactcca gacatctccc tattgcatgg atctgcactt 60
gactggcagc ctagacagaa ggastgctat ttgtcttttc tggctgacag ctgagcagga 120
ccagcgctgg ctgcaaccaa ggagcattgc ttcgcttgtc atacttctgc ttccaaacag 180
ccctcttttg tttgtgctgt gaagttccca taccgtctgc catctcagca tctcctctgg 240
ctgaacctcc ttcacagttt gtacyctayg ttaaattagc tgttcaattc ctccaggaga 300
aaggactgtg gctattagtt cttagaagcc ccaaagagcc cagtatgggc ctaggcttgc 360
actaggatcc catgaagcta gctggctggc tgggtgggtg gatcagaccg gcaaaagcac 420
tgtaggagct tgaaacccag cagac          445

```

```

<210> 53
<211> 425
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 53
cctctccttc tctgcgtgac cttgggctgg gagccacca ggaaatgttc tcgagaaatg 60
aggacttcaa ttccgagggtg gggagtgtca tctcctctct catgcctcag ttccccaatt 120
tatagacaag gtgggmaggag ccttcttgag gcccccttgg gctctgacat ttcattgaacc 180
ggtaacaccc ctcccactca gcatgcacct ggatgcccaa ggcgggtgtc tgggagaaag 240
gtctgctccc acagtgaaga ggccagggtg gcctccagcc tagggctggg gggcagggtc 300
ctcagtgcag agggctgagt gggctcttgt tcagacgggt ggtcagggag aggatgggtc 360
agagacagtg agcacagagg gargrgttca ggtgccttga gtggcacctc atggaaagaa 420
gccct          425

```

```

<210> 54
<211> 424
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 54
aacctcctac gggcctttta tgagctgtcg cagactcacc ggggtaatgg catcccccaa 60
agctgtgggtg tgaccstggg caatccctgg ggcctctcac tcccatgctg aggtgggtca 120
gacccacagc gcctgacctc aggtccctc tgggctgggc ctggtcccag gtgctgggat 180
ttgcgatggg cctgcgggga acatctagat cagctgggtc cttaagggcc gcaacgatga 240

```

```

acaggcccca cctgtctcc tcacactgcc actggcagta cacaaggccc ttgcttattt 300
atatttctga caacctgtaa ctctgggcag gccgactgca gctgacccca gctactgcag 360
aaaatgaagc ccagacaaag gagaggcca cactgctccc aagtgggtgga gctgttgttc 420
caat 424

```

```

<210> 55
<211> 393
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 55
agatgccctt gacactgact caaggctcag agaaggcggg cacctgccta aggccacccg 60
gtaggcccaa ggtgtatcaa gactccatcc caggacctct gggccctggg ctgcaggcct 120
gggccctacc cactgattga ttggacctgt gcctccwcca ggtgatggtc aagtggactt 180
tgaggagttt gtgaccttc tgggacccaa actctccacc tcagggatcc cagagaagtt 240
ccatggcacc gactttgata ctgtcttctg gaaggatcc cctggctagt tgggaccag 300
ggctgtgcac actgtggagt tctgttctgg agccagtga tggctgggccc cacactgtaa 360
aggggggatg accacctcag gcttgtgtcc act 393

```

```

<210> 56
<211> 499
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 56
gaacccatgt cctccacatc cacaagtctc caaagggttg gggattcctt gtgtgagctc 60
cagatcccaa tcctctggtg gttcatggtg ttgtcaatga cakgtctctc cttgtcacc 120
cagtatgaaa atgaggagac ttacagggtg cgaacattcc agataggtag aggggagaaa 180
ctggtgaagg ccttggttcc agcctttctg ggtagaacca tctcctccta tgccacctgt 240
ttgggcccct cctgggactt tatcaccgtg ccagacttca tggaggaact gtttaccagg 300
tgaatgtcca tcccctccaa ctacacgtgg tgactgtctc cgactagctg tgtcttgagg 360
atgtcaccga agccctctga gcctgtttgc tcctttgtaa agcagtgaga tgaacctcat 420
agggttctta tgggaactaa atggcctaag gcatggcaag caggtcccaa gtgcctggct 480
ctgtgaaaag gctgctgag 499

```

```

<210> 57
<211> 399
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 57
ccaggacagc tgaggacatt ccagaccctc scatctcctt cctggagcct cacaggcccc 60
cagagcccct gaaagggcag aaattggtca gctcagcagc cactcacact ggatcttata 120

```

```

gaggttgctg gtttccttct tggacagcag ggtggagtgg gcatccttcc ggggatccac 180
tttgtgaaca aagaggggagc ggaaccagct gccttcattg tccttggaat agaaactgca 240
ggacagagga gttgaggggg acgcgcggag gttgggggag ccccagcaat tccatccact 300
tggatgtcct gctcccctag accagtgacc cacatttctg ggaacagggc cacggagtcc 360
tgtggcagct ccagactgtg aaatgctatt ggagccagc 399

```

<210> 58

<211> 365

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 58

```

ggggtagcag agtagtcccc agaacagggc tgggctgcat cccacatcca gagaggtgtg 60
ctgagtggac actaacatac cttattgttt ttgagcttgt tcatgcagtc catgagggct 120
gggtagccac ctgagaatcg ccacaggtgc actgttgggg gtgagaggta taggtcagt 180
agctgctggg acccccagca gatgacctcc ycaaggttgg ctaagtgggt gggacggggg 240
aggcgggggt gcttggttcc ctgtagcagc aagactccct gagttccctc tgccttggtg 300
gaagaccatg ctggggaggg gatgacccta gacacaagtc taggagacct ggatttgagc 360
tccag 365

```

<210> 59

<211> 390

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 59

```

aatgaaccac gcagagcaca gagcacagga gcacgacgag gatggtgcaa ggcacccgcc 60
aaatcctctg ggctccrtga ctaaagctga gggaggaagt agccatcagg gtcccttttg 120
tgccgtctgg tctcggaact ccttggaact gatcactctc ttgctccctg cctaggcccc 180
tctccagaag gcccgatgcc cctgggtggg ggcgaggacg aggatgcaga ggaggcagta 240
gagcttcctg aggcctcggc cccaaggcc gctctggagc ccaaggagtc caggagcccc 300
cagcaggtgg gaccacatg gaggcctgca gaacctgagc tgtgaactgg caacctggc 360
tctggggccg agtcaccttg cacaaggagg 390

```

<210> 60

<211> 396

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 60

```

cccatgacac tggcttacct tgtgccaggc agatggcagc cacacagtgt ccaccggatg 60
gttgattttg aagcagagtt agcttgtcac ctgcctccct ttcccgggac aacagaagct 120
gacctctttg rtctcttgcg cagatgatga gtctccgggg ctctatgggt ttctgaatgt 180

```

```

catcgtccac tcagccactg gatttaagca gagttcaagt aagtactggg ttggggagsga 240
gggttgtagc ggcmgagcca gggctccac ccaggaagga ctmatcgggc aggggtgtggg 300
gaaacaggga gggtgttcag atgaccacgg gacacctttg accctggccg ctgtggagtg 360
ttgtgtctgg ttgatgcctt ctgggtgtgg aattgt 396

```

```

<210> 61
<211> 368
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
        amplicon sequence

```

```

<400> 61
cagagagcaa aggtcacagc tacctaaagt gtttcactt caagcacaga ttgtatgcct 60
gaagactaca taccttgcat tatcaaccag ttcagcaagr gcaccaaaca agaattcgtg 120
agtggttctg aaatgataaa tactaaaagt cagcaaaaaga attattgaag ttataattcc 180
taataaaaag ccatggttat aaaatattta agttttttga aaaaaatctt aaaaccacca 240
tttgcatgtt ttttatacta ctcaaggctt tccagagctc cccaactccc ctcaattgtt 300
aatctttaac aagtcctgcc atctattcag aaatgattat tcttcttatt ttgagttggg 360
aaacccac 368

```

```

<210> 62
<211> 451
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
        amplicon sequence

```

```

<400> 62
gatgtacacc actccctgcc tcccgcttta gaaatgaaga aaccatgggt cagaggggtg 60
tggagggtca cacagcatca cagggcccgga agtggaggag ctgggatatg gacacaggcc 120
cacctgcctt cagaccagac ccctgtgccc ccagccgccc caccacccac agaccccaga 180
gggaggacgt caggcgcca ggctggcacc tttagcttgg gcaggccrcc gcggatggca 240
tctgcaatgg caactgcacc cttggagcgc accaggcagt ccccaaaatt aatcacctcc 300
acctgccgca aggtcttcaa ggtctgtgag ggggaagcaa kggtccagag tgaggggtgca 360
gaccacaccc cagccctcag caagccccgg gggccccaca cggtcacatc ccaagccagc 420
caccacacac tgtcctcctc tgcaagtcac c 451

```

```

<210> 63
<211> 790
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
        amplicon sequence

```

```

<400> 63
ttagggaaga agggccaaag cactccttgt agcactcacc cctacccttc caagccaccc 60
cagccgggtg aggtacctgt cttcagcagc atcgctctgg actcagcttc cgaggacctg 120
accagatctg gtcctgcgtg atcagctgta tgtgttgggc tctggaagct aagaaacgtc 180

```

```

tgaaaagcac tgggggtcacg gctgcctggc tagctcggcc gccctcaacc ttaggcgtgg 240
atcgtaact cgggtcccaa gttgcccgcc ccatccccag ccatcacttc ccggagctts 300
agttcttctc tcagaaatac gaaacaacgt gtcttggatg tcagacctca caccctctgc 360
agtgcctggga gtcccagagg cctacggggc gccttcggcc ccgcccgggc tcagaaaaag 420
gcagccactg gcttaagggt accaagaaaag agcggagggg cggggctgcg gccagggtcc 480
ggacttccag ccgggtccgg gttcccgcgc tgggtcccc aaaaccgcag agccccctcc 540
caccgcactt atcctaccga agcgttcaga cctgccgccg cttctgactc gaatccggta 600
acctgataag tccgaagcgt tccagtggag gcggggcctc acgaaggcaa cccttcgcgc 660
aacctatcag aatccccctc agcaacgctg tgcccygcc atatgggtcc ggctcccgag 720
cctccctaag cccttcccca ytgggctccc gccctgcgtg ctacgcaggc wggcattggc 780
agaacggact                                     790

```

<210> 64

<211> 496

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 64

```

cttgtgacct tccaaggaaa ggaaccagca ctcatcaagg tccactggg caccagggtgc 60
tgggcttggc gtgctgtgtg ttatcccatt tcagcttccc agcaaccctc caagttagct 120
tcagccccc cccgcccc attttacaga aggaaaacac aaggctcagg aagtcagggtg 180
ccaccgaagg aaggtcctac ggctcagggg ggagcccagg tccaggctct gggacctggg 240
tggtgggggc gtgcagagcc tgagctggga cccagtgtg aggttcagcg gggcccagagc 300
tgcagacca ctgcccagg ctgaccgtac tggggggccc gctaacctct gcctcctttc 360
cttctacctt cccagggkaa tgatgcggaa gagcctaagg gggtcaccag cgaaggtagt 420
agtccccgcc cctgccgcc ctctcctttc cccagggtc tggcctcagg gcctaccctc 480
accctctccc cttcct                                     496

```

<210> 65

<211> 395

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 65

```

tagaaaggcc attcctcgtg agtataatca taaaccact cacaaaaatg gttcccaatg 60
tcaaagcccc tgggagaata aggtggacat tcagtcccca aatgccctgg gcagctggcc 120
tgttttcaag agccctrtgg gaacagatct atgggaagcc atctttccag cctcacctat 180
agttataact gctgtactcg aagtccacca gcatgaggct gtcagcattt tctggctctg 240
agagcagcaa gatgttcctt gggggaatgg ggtgaggttc tgctactcc agagccctct 300
ggctcttcca tcttgggtta ggagactcag atgccttctc ctaccttctt ggatgtcatt 360
gtggcagaag acgactggcg atggggtaga ctcta                                     395

```

<210> 66

<211> 353

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 66

```

cattccttcc agactccacc tccctccttc ctcacaggat gggtcctgct ccccagcctc 60
tggcccacat acctgctggt cttgagtggg gtagtctgtg ggccttgctt tgtagaaagg 120
ccattcctcg tgagtataat cataaaccca ctcacaaaaa tggttcccaa tgtcaaagcc 180
cctgggagaa taagggtggac attcagtgcc caaatgccct gggcagctgg cctgttttca 240
agagccctrt ggggaacagat ctatgggaag ccattctttcc agcctcacct atagttataa 300
ctgctgtact cgaagtccac cagcatgagg ctgtcagcat tttctggctc tga 353

```

<210> 67

<211> 598

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 67

```

ccatctgagc tattttccca cctctctcta cggtttaagg gcccagcagg agggagggag 60
caatcagact caagcctggr tgcaaatccc ggctctacca ctgctttcct gtctgatctg 120
aacgagttac ctaacctctc cgagcttata tacaaaagct gaatgatcct tccctcatag 180
agctattgag agaataagga gatggrrgga ggtcacacca tccccaaact accaagggat 240
cttcctctga cagagactga gcaagatcca gctggctctga gctgtgtgga tctercctcc 300
agctgtgcac ctatwtwta accagacacg tcctccagcc cccaagatat acccaggaat 360
tcgaaaggta aartgaaagt cacaacttcc cagcagctcr caatcaagca cagcaaacac 420
gctgctcccc agcacctcct gcagtccagc cccaccctcc ttgctgctgc gcttagatga 480
gcagcctgag accagacctc caggtctctt tcatccaacc cacctgcctg gcacacctcg 540
ggttgggggt ctgctatagt cttcaggaag aaagacctgc cactgacata ctgtggga 598

```

<210> 68

<211> 382

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 68

```

tgagagggac atcctcaagc ccagcagagg gggctgcctg gaggaggygt gcctgccaga 60
gaaaactagc ccggggagat ctgggtggca tcaccggggg gccccaagga ggtaacccca 120
tgagaggttac ctgggcaatt cagccacacg cactaatctc ttccaggctt catcgctagt 180
cagcaggatt ttcagatgca ctgggctaac tttcttctgg aagtattcaa tgacttcttc 240
agtgaagcgt ttcttttcta gttggaaaca aaaaggataa gattggaaga aagtttgcta 300
ccacataaat ggcattgagt ataaggtggg tcggtgttaa tcctcctgaa ccagctgtca 360
catgggggat ttttgatgga gg 382

```

<210> 69

<211> 398

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 69

```
cccttctcgc agctgattac ggtcacgtcg atcccgctctt tccagtctcc acgagacgga 60
gccccgggaaa agagtcgacc ccatgctctg ccgccccgc accccacccc tcgggaatcc 120
ccaccgtctt tcccaatcac cttcttcttc tcaaggctc ccatcgctcc acgttgagga 180
gccgactagg gccgcgcgta caggsagctc cacttcctcc cgcacgtgcc ctgccaaagga 240
ccccgaggac cctccccacc ccacgctgtc tgtttgwgcg ggctgccc aa tgagatgcct 300
gtayaagtcc agggaaagat ggggatttcc tcctcaagat ttaaaactat agtctgaaaa 360
aatcactga gaacactctt tccagatctt tcccgctc 398
```

<210> 70

<211> 398

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 70

```
ccactcttgt tcttgggcat cagctgggtg cctggctgtg ttagtgaccc agcccacaac 60
agccccctac tctaccctgg ctacatgcag tgcccatctc tggggtcact gcagagsaga 120
cctggctaatt gccaccctct cttccggctg cctttcagga agaccatgct caatgacctc 180
ctgcggttcg atgtgaaaga ctgctcctgg tgcaggtggg tggcccctg ctccagggcc 240
ctgcctttcc tcctagaaca cagtggcaca gtgctgggtc ccagttgcta gcagagtctc 300
tctcatcatg ggaagctaga aagaagcttc caggaggaga taaccacggc ctcaaggatg 360
ccacatccag agccgccctg tcaggctgag gagatcaa 398
```

<210> 71

<211> 380

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 71

```
tgaatcctca tctggggaag tttcaagaat aaaagcmgtc ccattctcagc agtctcgagt 60
gtggtgaaat gtgagcgggc cctgtgaggc cggggctgag ctgtcctctc cccctgcagg 120
tggcccagag tggcgagatc cccccatctt gctgcaactt ccccgtggct gtgtgccggg 180
acaagatggt tgtattctct gggcaaagcg gagccaaaat aaccaacaac ctcttccagt 240
ttgaattcaa ggacaagacg tgagtactct ggccagtggg gtggaggag gacggtcagt 300
tccctcgaat ccttctgaat atgaagaayg cctcttgac ctggtggccr tggtaaccat 360
ccttgtgagc tctgcaaaca 380
```

<210> 72

<211> 698

<212> DNA

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 72
 cagaagcatg gaattgctga caagcacaga gcttggcgtg gggttggagg ttgcatcagt 60
 ctctgcggt tgctgtagcg aagggtgca aactgggtgg ttggagcag cagacaggta 120
 ctacacagctt tgagggccaa ggtcccatc taagggtgtca gcaagggcag tgccctcaga 180
 gcctcagggg tgggtccttc ctgcctcttc caatttctgg tgggtgccag agttccttga 240
 agtcccttgg ctgcagctg tatcactctg ccttgggtctt tacctgccgc cttccctcgg 300
 catctgtgtc ttcacacggc cctcttgtaa ggacaccagt cattgcgtta gggccacacc 360
 taatcccgta tgacctctc taaacttatt acctctgcaa agaccctatt tccaaaaaag 420
 gtcacattcc cagtgtgtgg agttaggacc tcagtgtatc tttgcgggga cacagttcaa 480
 cctgctaccc atccatcatt ttgtattctg agatcttttt ttctgttttt agctatgtga 540
 aaggcatcta ctcttttggc ttgatggaaa ccaacttcta cgaccaggca gaaaaactcg 600
 ccaaagaggt aagtgggtcc ttcctaaggt gcctgacccc tcaggagta gcygttggct 660
 ggaccagggc atatgagggg caccattcgt gtgtgacc 698

<210> 73
 <211> 698
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 73
 gggggttgct ttttgcatag agaccatgac cagggtctggg acagaggaaa gtcaaataaa 60
 tcacacatta gagttagaag cagaggctca ggctgagccc aggtttatta tccaaaatca 120
 aaatgaaatg cagtgattaa aggacacaag gcctcagtgt gcatcattct cattgtggct 180
 ttcaggcgcc tgtggaagac aggggtgggga tgggtggcttc gggaggtgag gtgctctggg 240
 acttgggcaa gtcttargca agccattcct gctttctggg cctggctccc atgggccatt 300
 agaaatgaaa atgctttgtg gactgctgag gacggtgcaa ggggtgaggt tcccagctca 360
 ccggatcatg gccagcacc agggcatcag ctctgcttt atgggtgggt ctgcagggtg 420
 gaagtccctg gccttcagaa tgacctcatg ggccctcctg aagaggtcct cccccactgc 480
 tgcctccacg cgctgccgac atgtggccag cttgggtcgg ccttcgaaga cttggcagcc 540
 agcaccacag ggctgtgggg aaaagggtac agactgggga tggatgggtt tgagggcagg 600
 gatgggcagc atctgatttg gggaccacag atctccagga ggtgtttgca cacacactta 660
 agcacagtgc catagcccgg tgtggcagca taagcagg 698

<210> 74
 <211> 395
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 74
 ctctctgtgc cctcctcaga ccctcctcc tcctcccaca cgccactgt aaagggtcc 60
 tgcgtcagga gctgccaggc cgagggccag ggcacccsga ggacagctgc tccrgcagca 120
 ctaccccgat gcatgtcttc atacttgaga aaaagcacgt tcgagtccat gcgggtgctcc 180
 cagaactcct gcacgtgctc aaaccaggag ccgtagccca ctgcggagac aggggacagg 240
 gtgagccaca cggctgggca ggagaagcgc acacatgggg ccatcccccac cccacagggc 300

tgccctcctg ccaccagca gccgtgatga ggacatcgtg atccctgcgg acaagtctgg 360
 caaaggcccc cgaggcactc acgtcttgag ccatac 395

<210> 75
 <211> 383
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<220>
 <221> modified_base
 <222> (83)..(86)
 <223> c or not present

<400> 75
 ctggactgga ggccaaagtc ytgcggggaa cgtgcgggaa gagcagagcg tgcaggcagc 60
 rgagactaac aagaagccct ggccccagag gccaggaaca ggtggacgaa caaccagatg 120
 agagaacgta ccaggcatgc aagctagacc cagggaatcaa cgggctgagg cttagcgtcc 180
 cctacggcgt ccaccagcct gaccgcgggc ctgctgggccc cgggggggagg ggcccttcctg 240
 ctgggggtcga gctgcagcgc acgggtgggc attagaggca caatagagca ggtaggttag 300
 agctcctggg gggacagggc aggggcaggg ccgaggctgg cgatgtaagg gttggcctgc 360
 caggacagca caggtagcac caa 383

<210> 76
 <211> 385
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 76
 tgaatagtgc gttgcaggtc catgcacttg tcagtttggt catttcctgg aggtttctag 60
 ccctgggtgt ccatggccct tgcagatact tgctggtcag gaatgagcct tctgaggcaa 120
 gactgctgga ttgtccaggc agggctattg atgccagccc cttaacttaa ttctgcccag 180
 acaagaagat gtttgagggtg aagcggcggg agcagctgtt ggactgaag aacctggcac 240
 agctgaacga catccaccag cagtacaaga tccttgatgt catgctcaag gggctcttta 300
 aggtgtgtgc aggcaggggg cagctcatgg cagggtccagt ctttgatcta ggcactgatg 360
 ggtaaacagg agttccctaa cgggt 385

<210> 77
 <211> 357
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

<400> 77
 acaggagttc cctaacgggt tgggtgttcag ggacagggga actgcgcaca cgtaagactt 60

```

gaagtggggt ttaaataaat ggggatggga gcagtctgtg atgggcactg cgaagccact 120
cagccctggc gggattccct caggtgctgg aggactcccg gacagtgctc accgctgctg 180
atgtgctccc agatggggccc ttccccagg acgagaagct gaaggatggg atggtctgcc 240
ctgccccgcc ctgtcctccg caccaccga tcttctctag ctgtccttc tctcctgttc 300
ttgtcactct ttttttctcc ccggaagtgc cctcttgtag caccttctaa gtggtcc 357

```

<210> 78
 <211> 355
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```

<400> 78
gcagagatca gagcatcgaa taatggttgc taaaatatct tggaaaagga aacagtccta 60
tccagatgaa atgtgttcat accgtagaca tgacagagac cagctcttgt tcagtgtccc 120
ctacctgctg gctgcttctc oggctcctcg aacagatcag ccgagcttat ggaggaaactt 180
gcygacagcc tctctaggcg ggccctggtc tcatactaga gaagacaagg aaaaggaaat 240
gttaggctcc aaagaytggt ggcagttttg caaaaagaat cacygaagag ctgtcatttg 300
aaagtgtttg acccccaggc tctttcyttc caacagttac tgaatgccac tgcca 355

```

<210> 79
 <211> 399
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```

<400> 79
ccttagaagc ctggaactct tgtaaataag gtagctatct gtatgaacag gaaactgagt 60
cagcttatta ggaaatgata agattctgca gaagaacata ttgtatagtt ttccgtagaa 120
agaggagagg cttaattcct ttttgttttg aacttagatc aaattactca ttaaacaaga 180
tgatgacctt gaagttcccg cctatgaaga catcttcagg gatgaagagg aggatgaaga 240
gcattcagga aatgacagtg atgggtcaga gccttctgrg aagcgcacac ggtagaaga 300
ggtgagtttg ggtctctcac agctatccca gaggaacttg cactcccaga ggtcggagggt 360
catcctgaag cctgccaggc caaggtgtac tgagggcag 399

```

<210> 80
 <211> 379
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 amplicon sequence

```

<400> 80
ttccacctcc cttgttggtc tccctgcccc ctgcctggct ccctctctgcc tcttagagct 60
tgtaactgtc tttgttgatc cttcttgtag acttgggcat agacctcggg cctgggtccct 120
gcaaggagcg ggtgtgaatg ctccacggcc ccttagctac ctgtgacacc ttgtgcccac 180
aggttccgta gtaagatgga agctgctggc ttcactatct cgggagccag tcaccccatc 240

```

```

tgccctgtga tgctgggtga tgcccggctg gcctctcgca tggcggatga catgctgaag 300
agaggtaaag gtgctgagac aagggaaactg gtgggtgggtc ctgagagaag agaaagggaa 360
acccttagac tgtgacca                                     379

```

```

<210> 81
<211> 398
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 81
gccagcatta aataaaagag ccaggaatta aaattttagt gtcctaatgc ctctacataa 60
tttgccgtat tttcctttca tggcttagct ataggaaatt taccctctgg gctctctcat 120
gctcttctcg agccttctta actcgttcta ttctttcttt gatctctcgc tcttcacgtt 180
ttcgtcdata ctttctccga tgttctgcaa ttttctgtgc ctagaaaaaa gagccatagc 240
aaaataagct tgctccaaaa gctgaataac atcaacacaa atattctttg tagagagatg 300
tttaattcaa catgcagttc agaaaaatga cagatttgtc ttgtasaaaa agacctaaac 360
caagctaagc ctttaagaaa accaacctca actgcatg                                     398

```

```

<210> 82
<211> 371
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

```

```

<400> 82
tctgctcctt gtcctcatcc ccacccatga gcaggacatg aacccccaga gcctgccaga 60
gcatgctctg cacagtaagt aagtgtgtgt ccaggcacag aacgccaag agaaggccca 120
gaggggcgcc cattcccga gagagcttca gtacctgtcc tgaagctgga cacggtggcc 180
ccagttcaag gatttcacgt gattttgaac agcttctgcc atcttctccc tgtgaagata 240
cgaaacaaaa tgtaaaatcc acaacacagg tgtagctgc agggcctcac ratggactat 300
tagattcaaa tggtagattc atagaaatat caaaaaaaa gagtgctttt aaaggtggca 360
aaacgtgaca t                                     371

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<210> 83
<211> 395
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: Synthetic
      amplicon sequence

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<400> 83
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cccgccatgc gtccccattc cgcactactc ggtctctccc acagggatga cggaacacac 180
caagaacctc ctacgggcct tttatgagct gtcgcagact caccggggta atggcatccc 240
ccaaagctgt ggtgtgaccc tgggcaatcc ctggggcctc tcactcccat gctgaggtgg 300

```

```

gtcagaccca cagcgctga cctcaggctc cctctgggct gggcctggtc ccagggtgctg 360
ggattttgca tgggcctgcg gggaacatct agatc 395

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<210> 84

<211> 328

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
amplicon sequence

<400> 84

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gccatgggtgc acatcccagt ccacgacgag gatcctgggt acagacagcg ctgggtggcaa 180
aggggcaggg cctcccacct ccaggagccc ggccagggat gggaagggtgc tggctgggtt 240
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tggcacacac ctgtgtagcc cgtgtttc 328

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<210> 85

<211> 483

<212> DNA

<213> *Mycobacterium chelonae*

<400> 85

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agcgttgtcc ggaattactg ggcgtaaaga gctcgtaggt ggtttgtcgc gttgttcgtg 480
aaa 483

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